JANUARY 1998

Update

America's New Deficit

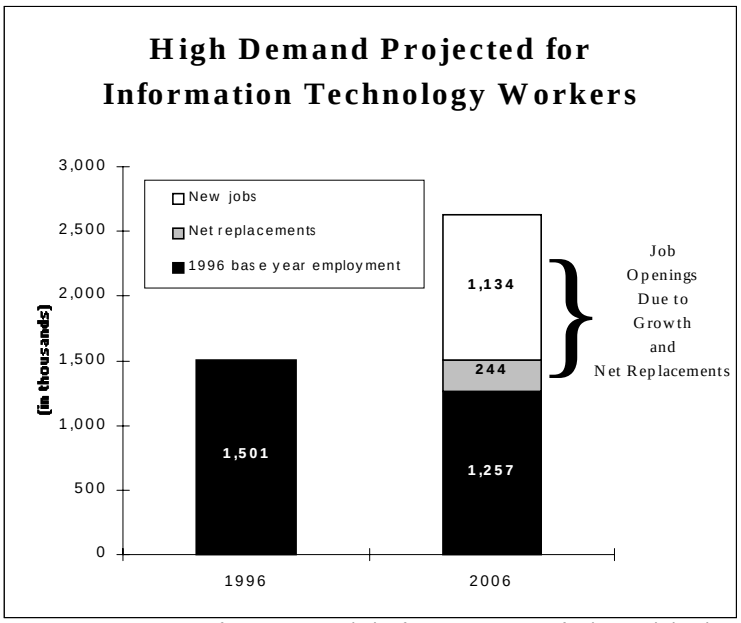
OFFICE OF TECHNOLOGY POLICY U.S. DEPARTMENT OF COMMERCE

Very Rapid Increase in Demand for Core Information TechnologyWorkers Projected for the 1996-2006 Period

The Office of Technology Policy analyzed Bureau of Labor Statistics' growth projections for the three core occupational classifications of IT workers—computer scientists and engineers, systems analysts, and computer programmers—to assess future U.S. demand.

BLS projections indicate that between 1996 and 2006, the United States will require more than 1.3 million new IT workers in these three occupations—an average of about 137,800 per year—to fill newly created jobs (1,134,000) and to replace workers who are leaving these fields (244,000) as a result of retirement, change of professions, or other reasons. [Figure 1]

Of the three occupations, the largest growth in jobs is accounted for by systems analysts, which are projected to increase from 506,000 in 1996 to 1,025,000 in 2006, a 103 percent jump. This compares to a projected increase of 14 percent for all occupations. The number of computer engineers and scientists is expected to grow by 114 percent, from 427,000 to 912,000 over the same period, while the number of computer programmer positions is expected to grow at a slower 23 percent rate, from 567,000 in 1996 to 697,000 in 2006. However, while only 129,000 new computer programmer jobs are projected to be created during this period, 177,000 new programmers will be required to replace those exiting the occupation. [Figure 2, next page]



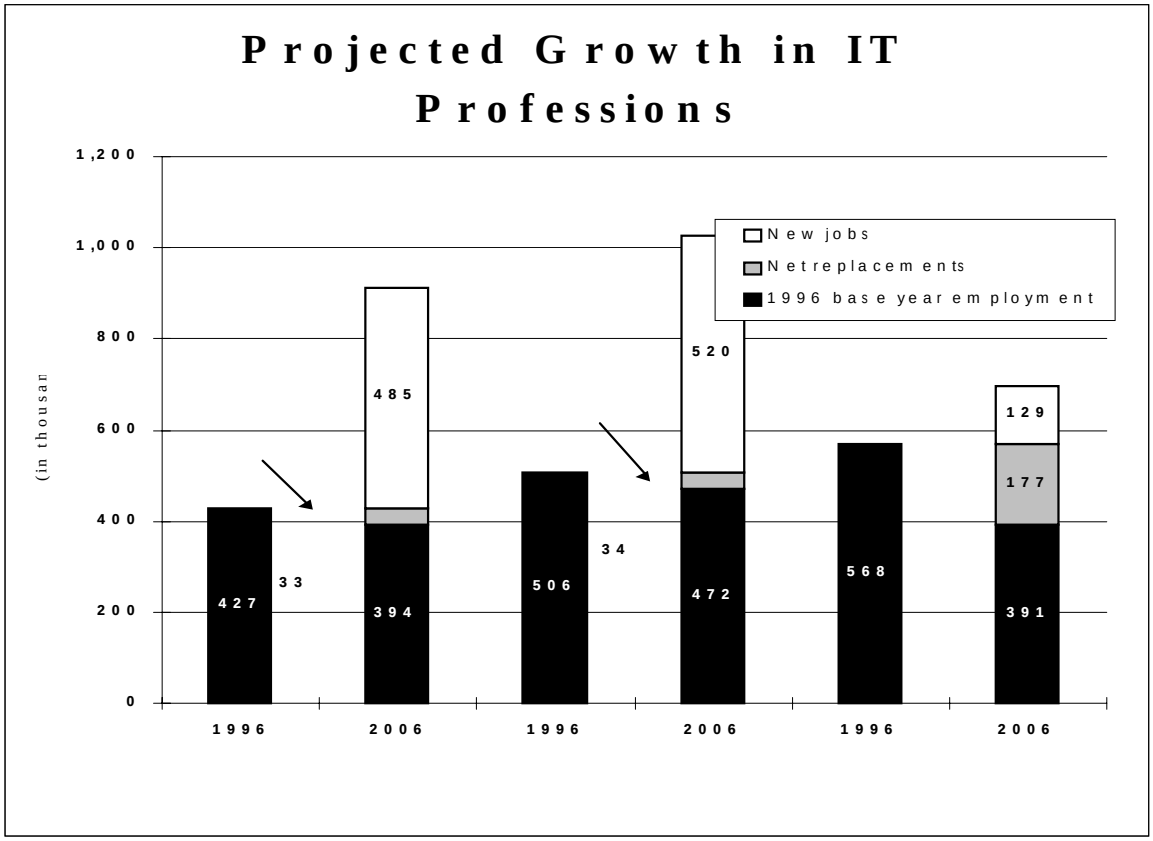
Source: U.S. Department of Commerce analysis of U.S. Department of Labor Statistics data

Figure 1

The service sector (not including transportation, communications, finance, insurance, real estate, and wholesale and retail trade) is expected to absorb the lion's share of all increases in these core information technology occupations. By 2006, the service sector is expected to increase its employment of computer systems analysts, scientists, and engineers by 177 percent and computer programmers by 47 percent. In contrast, the number of computer scientists and engineers and systems analysts in the manufacturing sector is expected to grow much more slowly (approximately 44 percent), while the number of computer programmers is expected to decrease by about 20 percent.

Certain industries are more IT worker intensive than others and thus, would be more affected by tight IT labor markets [Figure 3, next page]. And these industries are only growing in their IT worker intensity. In the most IT worker intensive industry—computer and data processing services—it is projected that, by 2006, 41.3 percent of the industry's employees will be computer programmers, systems analysts, and computer scientists and engineers.

However, IT worker intensity does not tell the whole story. The size of an industry's IT work force is an important consideration. For example, while the Federal government is projected to be less IT worker-intensive in 2006 than many other industries, the sheer size of its IT work force (96,704) would make tight markets for computer programmers, systems analysts, and computer scientists and engineers a troubling problem. When IT worker intensity and size of IT work force are taken together, a picture emerges as to which industries' competitive performance would be most adversely affected by difficulties hiring highly skilled IT workers [Figure 4, next page]. The computer and data processing services industry stands out starkly as an industry with much at stake in the supply of IT workers.



Source: Bureau of Labor Statistics, U.S. Department of Labor

Figure 2

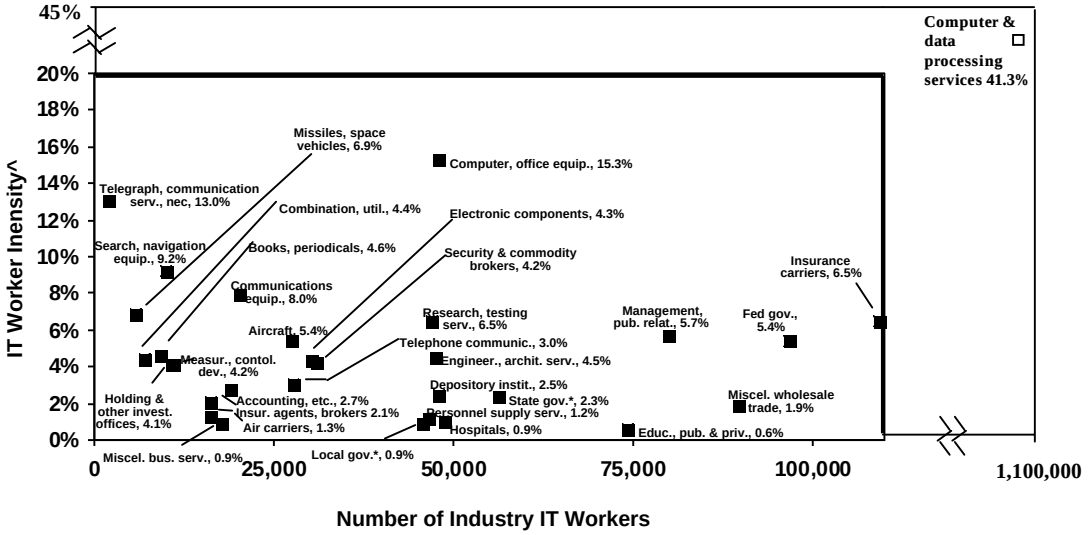
Industry IT Worker Intensity†

	1996	%		2006 Projection	%
1	Computer and data processing services	33.5%	1	Computer and data processing services	41.30%
2	Computer and office equipment	12.4%	2	Computer and office equipment	15.31%
3	Telegraph &communication services, nec	10.0%	3	Telegraph & communication services, nec	13.03%
4	Search and navigation equipment	7.2%	4	Search and navigation equipment	9.23%
5	Communications equipment	6.2%	5	Communications equipment	7.98%
6	Life insurance	6.1%	6	Life insurance	7.65%
7	Medical service and health insurance	6.1%	7	Medical service and health insurance	7.60%
8	Security &commodity exchanges & svces	5.8%	8	Security &commodity exchanges & svces	7.17%
9	Research and testing services	5.3%	9	Banking and closely related functions, nec	6.94%
10	Banking and closely related functions, nec	5.3%	10	Guided missiles, space vehicles, and parts	6.89%
11	Guided missiles, space vehicles, and parts	5.2%	11	Research and testing services	6.47%
12	Management and public relations	4.6%	12	Management and public relations	5.71%
13	Fire, marine and casualty insurance	4.3%	13	Fire, marine and casualty insurance	5.47%
14	Aircraft and parts	4.1%	14	Federal government	5.41%
15	Federal government	3.6%	15	Aircraft and parts	5.35%
16	Engineering and architectural services	3.5%	16	Periodicals	4.69%
17	Periodicals	3.4%	17	Engineering and architectural services	4.50%
18	Electronic components and accessories	3.3%	18	Combination utility services	4.44%
19	Measuring and controlling devices	3.2%	19	Books	4.42%
20	Combination utility services	3.2%	20	Drugs	4.41%
21	Crude petroleum, natural gas, & gas liquids	3.2%	21	Electronic components and accessories	4.33%
22	Drugs	3.1%	22	Crude petroleum, natural gas, & gas liquids	4.32%
23	Federal and business credit institutions	3.1%	23	Measuring and controlling devices	4.16%
24	Holding and other investment offices	3.1%	24	Holding and other investment offices	4.09%
25	Tobacco products	3.0%	25	Tobacco products	3.99%

† Perent of industry workers that are computer scientists and engineers, systems analysts, and computer programmers.nec=not elsewhere classified
SOURCE: Bureau of Labor Statistics, U.S. Department of Labor

Figure 3

Projected Year 2006 IT Worker Intensity versus Size of IT Workforce for Selected Industries



^"IT worker intensity" is the percentage of a given industry's workers that are computer programmers, system analysts, and computer scientists and engineers. *State and local government numbers do not include education employees.
SOURCE: U.S. Department of Commerce analysis of U.S. Department of Labor, Bureau of Labor Statistics, 1996-2006 occupations projection.

Figure 4

Did you know...

FACTS ABOUT AMERICA'S IT WORK FORCE

- The demand for highly skilled computer professionals has increased dramatically. One estimate, using data from the Current Population Survey (Bureau of Labor Statistics), shows that between 1988 and 1996, employment levels for computer systems analysts and scientists more than doubled, growing by 128 percent. In comparison, during the same period, the number of workers employed in professional specialty occupations increased by 25 percent and the total number of workers in all occupations in the United States grew by 10 percent. Data from the Occupational Employment Survey (Bureau of Labor Statistics) show that employment levels for computer systems analysts, engineers, and scientists more than doubled from 1988-1996, growing by 133 percent. During the same period, the number of professional specialty workers grew 24 percent, and the number of workers across all occupations in the United States grew by 12 percent.

- The Bureau of Labor Statistics projects that database administrators, computer support specialists and all other computer scientists; computer engineers; and systems analysts will be the fast growing occupations in the years 1996-2006.

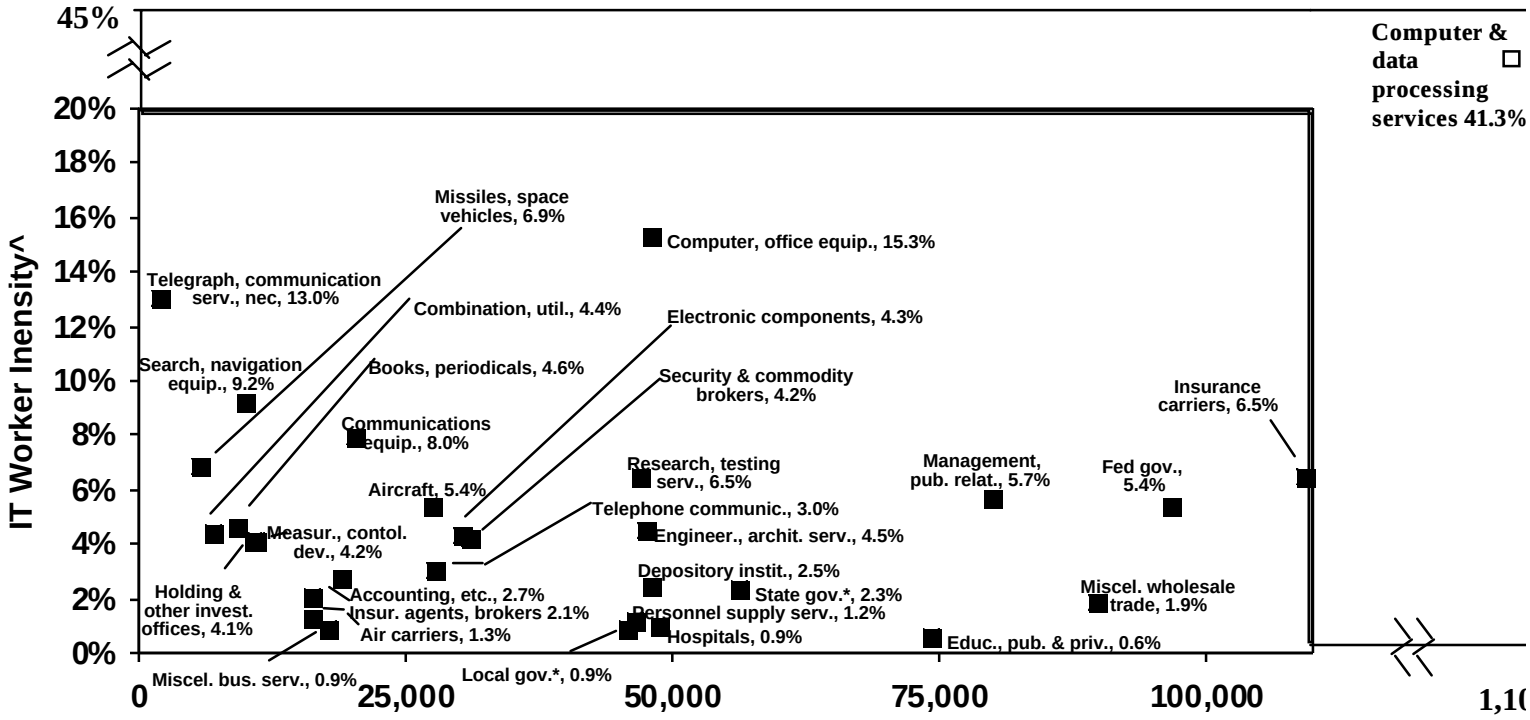
- A recent survey by the Computing Research Association showed that bachelor-level enrollments at U.S. Ph.D-granting departments of computer science and computer engineering were up 46 percent in 1996.

- Many people who work in skilled information technology jobs come from educational backgrounds other than computer science and engineering. According to 1993 data from the National Science Foundation, about one-third of people working in computer programmer employment hold degrees in computer science, and about one-quarter of those in computer and information sciences employment hold computer and information science degrees. Other workers in these fields hold degrees in areas such as business, social sciences, mathematics, engineering, psychology, economics, and education.

- According to the 1996 Current Population Survey, 80 percent of computer programmers and 72 percent of computer systems analysts and scientists were 44 years of age or younger.

- Women and some minorities are underrepresented in the high-skill information technology work force. According to the 1996 Current Population Survey, 28 percent of computer systems analysts and scientists, and 31 percent of computer programmers are women. Blacks comprise 7 percent of computer systems analysts and scientists and 5 percent of computer programmers; while 2.5 percent of computersystems analysts and scientists, and 4.6 percent of computer programmers are Hispanic.

Projected Year 2006 IT Worker Intensity versus Size of IT Workforce for Selected Industries



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SOURCE: U.S. Department of Commerce analysis of U.S. Department of Labor, Bureau of Labor Statistics, 1996-2006 occupations projection.